GUIDE TO THE *Nature Trail*

SANTA BARBARA BOTANIC GARDEN

THE NATURE TRAIL

The Nature Trail is designed to increase your enjoyment of the Santa Barbara Botanic Garden by calling to your attention interesting plants and animals found in the Garden. As you wander along the Nature Trail, look for the redwood posts with the yellow numbers. For each post there is a paragraph correspondingly numbered in this guide.

The Nature Trail includes parts of several trails in the Garden. It begins with the Arroyo Trail leading to Mission Creek which is crossed on stepping stones. You will then be on the Canyon Trail until crossing the creek again to the Dell Trail. After following the creek to the Old Mission Dam the trail leaves the creek and follows the Prichett Trail up the canyon slopes and down again ending at the Campbell Bridge. A leisurely walk along the Nature Trail usually takes about an hour and a half.

Most of the Nature Trail is through native Mission Canyon vegetation. The plants and animals in their natural setting illustrate the interdependence of organisms, and the functioning of a community as a whole. Along the Nature Trail you will be able to compare the plants and animals in the lower part of the canyon with those of the chaparral on the upper portion of the Prichett Trail. You will find many differences between them. The real purpose of this trail is to improve observation and thereby gain an increased understanding and enjoyment of nature.

The Santa Barbara Botanic Garden is open to the public daily without charge from 8 A.M. to sunset except in rainy weather.

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The Nature Trail

SANTA BARBARA BOTANIC GARDEN

1. ISLAND IRONWOOD, Lyonothamnus, has very hard wood, shreddy grey bark, and large flat clusters of tiny white flowers which turn brown with age.

A tree with more past than present, fossil records from Mint Canyon to Berkeley show that it was once widely distributed over southern California. Today its native stand is limited to the islands off the coast.

The CATALINA ISLAND IRONWOOD, Lyonothamnus floribundus, with simple undivided leaves, occurs primarily on Santa Catalina and San Clemente Islands.

The SANTA CRUZ ISLAND IRONWOOD, Lyonothamnus floribundus var. asplenifolius, with divided fern-like leaves is found on Santa Cruz and Santa Rosa Islands. This species is commonly cultivated.

The Santa Cruz Island Ironwood is the official tree of Santa Barbara County.

2. MONTEREY PINE, Pinus radiata
The long needle-like leaves of pines are usually borne in clusters of 2 to 5 needles. Each cluster is surrounded at the base by thin dry scales and falls from the tree as a unit. Even in the 1-needle Piñon Pine of southern California the needle is surrounded by scales at the base.

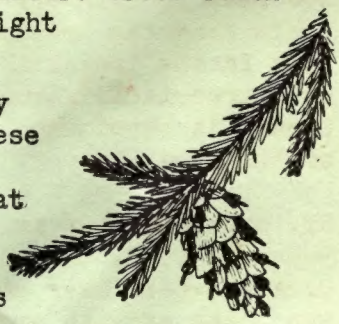
The Monterey Pine is considered a 3-needle pine, but on some trees many clusters have only 2 needles. The cones of this pine are borne in rings around the branches, and remain on the tree for many years even after their seeds are shed.

Monterey Pine is now native of the area near Monterey. Fossil records show that it once was native in the Santa Barbara region where it still grows well under cultivation.

3. Wounds on the trunks and branches of trees heal by the growth of callus layers over the cuts and breaks. Such layers originate around the outside of the wound, gradually growing into the center, thus sealing the exposed dead wood against rotting and disease-causing fungi. Smooth cuts close to the main branch callus over more readily than ragged stumps.

4. RED BUD, Cercis occidentalis. Unlike many of our native plants, the Red Bud shows definite seasonal changes. In the spring its rosy pea-like flowers appear before the leaves are out. In summer its seedpods are almost hidden by the masses of green leaves. In fall the leaves drop off, but the pods still hang on the trees. In winter the branches are bare.

5. DOUGLAS FIR, Pseudotsuga menziesii, is one of the important timber trees of the west coast, being sold for construction purposes both under its own name and as Oregon Pine. In favorable sites mature trees reach the imposing size of 250 feet in height and eight feet in diameter.



Douglas Fir is readily identified by means of its slender oval cones. These hang like pendants from the upper branches and are readily seen even at a distance. On closer examination small 3-pointed bracts are seen to project from between the thin scales of the cone.

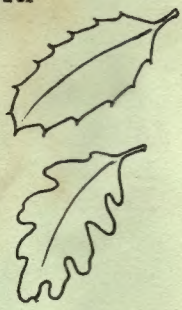
6. On this bank you see a variety of plants that require both shade and moisture. The STREAM ORCHIS, Epipactis gigantea, COMMON MAIDENHAIR, Adiantum capillus-veneris, and SWEET COLTSFOOT, Petasites palmata all occur in wet, wooded places.

7. The brown-colored rocks, both large and small, conspicuous throughout Mission Canyon, are blocks of EOCENE SANDSTONE. These were originally formed from sediment carried by rivers and deposited in the sea some 60 million years ago.

8. LAWSON CYPRESS, Chamaecyparis lawsoniana, is widely grown as an ornamental tree both in this country and in Europe. Numerous horticultural varieties, differing from the typical tree in size, shape, and foliage color are also available in the nursery trade. Some of these are growing near this specimen.

As a forest tree in N.W. California and S.W. Oregon, this tree is lumbered under the name Port Orford Cedar. Its wood has many uses but the native stands are limited and very little uncut forest is left. Many fine racing boats have been built from timber of Port Orford Cedar.

9. WHITE OAKS have light-colored scaly bark, light wood, leaves with smooth rounded lobes and acorn shells that are smooth and naked inside. BLACK OAKS have dark-colored furrowed or smooth bark, reddish wood, leaves with spine-tipped teeth or lobes, and acorn shells covered with matted hairs inside.



To which of these groups does the COAST LIVE OAK, Quercus agrifolia belong?

10. GIANT COREOPSIS, Coreopsis gigantea, grows only on the steep cliffs of the Ventura and Santa Barbara coasts and the off-shore islands.

Its grotesque swollen stems exhibit a succulence common to many plants of very dry habitats. Within this thick stem sufficient water is stored for the plant to send forth leaves and flowers even though the soil may be very dry.

The triangular marks on the older stems are leaf scars left when the leaves fall off during the extreme drought of summer.

11. At this point the trail enters an area of native Mission Canyon vegetation. The plants seen here are all in their natural state and are in much the same condition as when the Padres first came to this country.

12. MUGWORT, Artemisia douglasiana
Many uses of this common plant were found by the Indians of southern California. For them its stems served as a material for their arrows and it leaves as a source of hair tonic. As a medicine it was used for the treatment of such miscellaneous ills as poison oak, colic, rheumatism, and headache. Still today a lotion from its leaves is widely used as a treatment for poison oak.

13. CALIFORNIA BAY, Umbellularia californica
The spicy fragrance of this creekside tree has given it many uses. Crush a leaf between your fingers and note the aroma. The herb cooks of today dry the leaves and use them in their kitchens for Bay flavoring. The Indians parched the kernels and used them as a spice and also used a tea of the leaves as a disinfectant.

14. DUFF on the forest floor is made up of partly decayed fallen leaves and twigs (a). It is a valuable agent in soil building (c) and soil maintenance because:

a. It contributes organic matter to the soil as it decays. (b)
b. It acts as an absorbent sponge to prevent run-off of rain water.
c. It forms a protective cover which prevents the heavy beating and spattering of soil by rain drops.
d. It provides food and shelter to a tremendous number of micro-organisms and insects whose activities are important in the building of fertile soil.

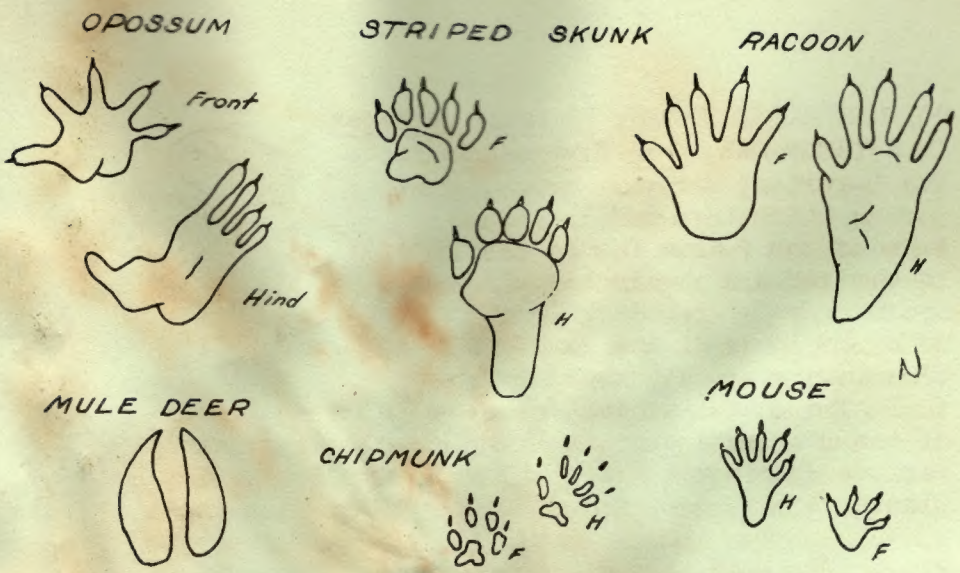
15. POISON OAK, Rhus diversiloba. Its 3-parted, somewhat shiny, green leaves which turn red in autumn make of the Poison Oak an easily recognized and ornamental plant.

"Poison" it is to the many people whose skins are irritated by the plant juice, for contact results in a rash the extent and severity of which varies with the individual. Contact with the plant, with clothing or animals that have brushed against it or with smoke particles produced in burning it are all likely to cause this most uncomfortable result.

16. BLACK COTTONWOOD, Populus trichocarpa, is a tree found along streams from California to Alaska. It is deciduous and the leaves that provide soft shade in the summer turn golden yellow in the fall and drop to the ground. Leaf scars on the twigs mark the spots where leaves have dropped off.

Notice the long, slender, reddish brown buds at the tips of the branches. As they swell before opening, you will see a sticky orange resin oozing from them. This protects the tender growing point within against insect injury and drying out.

17. On the canyon floor and its lower slopes are the tracks of many animals attracted by the presence of water and food in the form of seeds and insects. Besides the numerous bird tracks, watch for the following:-



18. Throughout the canyon you will see rocks that show the marks of early day stone workers who cut stone to be hauled into Santa Barbara. On this old quarry site the stones were cut by hand with steel wedges that were pounded into the rock until it split. Elsewhere in the canyon you will notice rocks that show the smooth round holes drilled by chisels attached to an air compressor.

19. As you go along the trail, you are walking through an OAK WOODLAND typical of canyon bottoms in this area. Due to the shade and wind protection of the oaks and the mulching effect of the duff, the soil moisture content is high, making the woodland floor a good site for thin-leaved, shade-loving plants. Common among these are:

SNOWBERRY,
Symphoricarpos
mollis

CANON SUNFLOWER
Venegasia carpesioides

WILD BLACKBERRY,
Rubus vitifolius

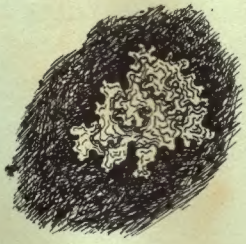
20. WESTERN SYCAMORE, Platanus racemosa is a deciduous tree. That is, it loses its leaves in the winter.

Although most plants bear buds plainly in the axils of their leaves, the sycamore buds are completely surrounded by the base of the leaf stalk and come into view only when the leaves fall. The leaf-like collar at the base of the leaf is a stipule. Stipules of various shapes and sizes occur in many plants.

21. WHITE ALDER, Alnus rhombifolia
The saplings in the stream bed and the mature trees with slender grey trunks along the creek are alders. The closer to water their roots are, the better they thrive, and they never grow far from water courses. The flowers of alders form in catkins of two kinds. The slender catkins bear pollen, and the cone-like ones bear seeds.

22. The two faces of the big boulder across the creek are covered by two very different kinds of plants - grey lichens on the south and dark green moss on the north. Which side of the boulder is more shady and moist?

23. Along with the mosses on this rock are many kinds of LICHENS. These are composite plants made of algae and fungi intertwined to form a solid structure. There are many kinds of lichens, varying in size and form and color.



Some lichens grow like crusts on the rock surface and are called "crustose" lichens. Others are ruffled and leafy in appearance. These are "foliose" lichens. Less common are the "fruticose" lichens which are slender

and branched and may stand up from the rocks or hang from tree branches. On this rock are examples of the first two groups. How many of each kind can you count?

24. In the deep shade on the canyon floor grow many species that have large, thin leaves. Many of these plants would not survive in direct sunlight. Notice the number of different plants that occur on the shaded bank across the creek.

25. The Mission Dam was built in 1807 by the Indians, under the direction of the Franciscan Padres, as part of the Santa Barbara Mission water system. No longer used, the dam now serves as a landmark in history, and in spring, as a site of masses of a native fern, the California Polypody.

26. Whenever there is water in this pool WATER STRIDERS appear on its surface. These long-legged insects live <u>on</u> the water but never <u>in</u> it, for fine hairs on their feet prevent actual wetting by the water, and the very light weight of the insects prevents their sinking through the surface film of water. Watch them dart over the water in search of insect food.

27. A major fire in the fall of 1964 swept through portions of Mission Canyon singeing and charring many of the trees north of the dam.

WILLOWS grow in the creek bed near the dam. They have narrow, silver-grey leaves and tiny flowers borne on two types of catkins. The flowers have no petals since the pollen is transferred by the wind.

28. A rustle in the leaves on the ground along this trail usually indicates a lizard. Lizards are cold-blooded animals and need the warmth of the sun to activate them. Your chances of seeing them are thus greater on this hillside than on the canyon floor, and on a sunny day than on a cold one.

29. Soil-forming by plants is in process on this boulder. The lichens and mosses growing on its face supply a rough surface for the collection of dust particles from the air. Gradually over a period of years, sufficient soil will have accumulated for the growth of ferns and small flowering annuals. Finally, and particularly in cracks on the rock, a deep enough layer of soil will have formed for a shrub or tree seedling to survive. As this process continues, the rock will eventually be covered with soil in which native plants will grow.

30. This boulder shows a more advanced stage in soil formation than the previous one. Once bare, its surface has now collected soil to a sufficient depth to support a colony of ferns, Shooting Stars, Dodecatheon clevelandii, and other herbs, as well as a small shrub.

31. From this point, unless the day is too hazy, may be seen Santa Cruz Island, one of the Santa Barbara Channel Islands.

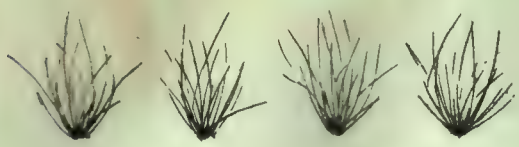
Once, the coastline of what is now southern California was located out beyond these islands, and the islands were part of the coastal mountain range. Gradually the sinking of the earth's surface below the ocean level resulted in the present coast line, but the mountain tops of the earlier ages still remain above water as the islands of today.

On these islands are several species of plants which today exist nowhere else. Fossil records show that they once existed on the mainland as well, but here they have died out, whereas the isolation of the islands has given them protection.

32. BLACK SAGE, Salvia mellifera is a low shrub often found in the chaparral. It is a member of the Mint Family and has square stems, opposite leaves, and a minty fragrance. Its lavender flowers are borne in rounded whorls that occur on the upper portion of the stems. What other plants along the trail belong to the Mint Family?

33. BUNCH GRASS, Stipa lepida, gets its common name from its habit of growth. A hillside covered with it looks bumpy because of the many thick tufts of Bunch Grass.

Wherever gentle slopes of fine deep soil alternate with the rocky brush-covered hillsides of this area, the perennial Bunch Grass is found. It is a good grazing grass, but it is killed out by overgrazing. Over most of its original range this has taken place. In such instances it is replaced by annual grasses and weeds such as Wild Oats, Filaree, and Mustard, all of less grazing value.



34. CHAPARRAL is a type of brushy vegetation common on sunny hillsides and mountain slopes of southern California. Chaparral is composed of many different species, but all the plants within this community have similar characteristics. They are densely branched evergreen shrubs. They have small, thick leaves, and can survive long periods of drought.

Chaparral plants are adapted to recover following a fire. Some have underground root crowns that sprout following injury; others have hard-coated seeds that can withstand the heat of a brush fire and still remain viable. Some chaparral plants even require extreme heat before germination will occur.

Here you will see revegetation of a chaparral area following the fire of 1964.

A. SCRUB OAK, Quercus dumosa
These plants were up to fifteen feet tall before the fire. Now they are stump-sprouting freely and you will note new growth among the burned branches. Look for acorn cups among the foliage.

B. MOUNTAIN MAHOGANY, Cercocarpus betuloides. The hard wood of this plant was used by the Indians for arrowheads and digging sticks. In summer and early fall it is covered with small dry fruits, each tipped with a long silvery plume which aids in its dispersal by wind.

C. TOYON, Heteromeles arbutifolia
California Holly, as it is also called, is an inconspicuous member of the chaparral except for a short time in summer when it blooms, and in late fall when its bright red berries supply the native birds with winter food.

35. The WREN-TIT is a common bird of the chaparral, seldom seen but often heard. As you walk along the trail

Listen for a series of short notes, all on the same pitch and often speeding up towards the end of the series:
Watch for a sparrow-sized, dusky brown bird with a long tail, cinnamon colored underparts, and a white eye.

36. This slide area demonstrates the importance of plant cover. Vegetation lessens the impact of falling rain, retards run-off of rain water, and prevents heavy erosion and loss of top soil. The best plants for erosion control are ones with extensive root systems.

The loss of vegetative cover from this area has produced the erosion problem seen here. Annual grasses were planted for quick control. Shrubby plants seen here now are Bush Monkeyflower, Honeysuckle Penstemon, Mountain Mahogany, and Mule Fat.

37. A woodpecker built his pantry in the dead branches of the old sycamore standing up from the canyon slope. The Acorn Woodpecker drills holes in trees and poles near the Coast Live Oaks. Into the holes he pushes acorns from the oaks, thus storing them against winter food shortage.

38. Ferns are essentially moisture-loving plants. Our native ferns adapt themselves to the long dry summers in various ways.

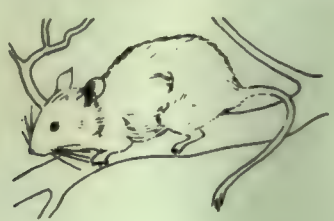
a. Some lose their leaves entirely as the dry season progresses. Their fleshy roots remain dormant during the drought and, with the first rains, send up a new set of leaves in an amazingly short time. Ferns of this sort are CALIFORNIA POLYPODY, Polypodium californicum, LACE FERN, Cheilanthes californica, and WESTERN BRACKEN, Pteridium aquilinum.

b. Some ferns roll up their leaves into tight balls which expose little surface to the air for loss of moisture. With the first rains the leaves unroll and are ready to function. A fern of this type is the GOLDBACK FERN, Pityrogramma triangularis.

c. The leaves of still other ferns remain active even in the dry summer season. Such ferns have thick leathery leaves covered with a waxy layer which helps conserve moisture. In this group are BIRD'S FOOT FERN, Pellaea mucronata and COFFEE FERN, Pellaea andromedaefolia.

39. WOOD RAT'S NEST

The mass of twigs piled up in the shrub a few feet above the trail is not there just by chance. It is the home of the Dusky-footed Wood Rat who builds a mound of brush and then locates his nest of grass and small twigs near the center. You will often see such nests in the hills but you will seldom see the rat, as he is a nocturnal animal living on acorns and seeds.



40. Surface marks on the trunk of a tree are clues to its past. The ring around the trunk of this oak tree suggests a possible use of the tree as a fence post at one time.

41. GIANT RYE GRASS, Elymus condensatus, thrives better in wooded and shady spots than it does on the dry, sunny sites which most grasses prefer.

42. Watering maintains this bank of CHAIN FERN, Woodwardia fimbriata, on this otherwise dry location. Normally it is found only in springy spots in the foothills where there is all-year seepage.

43. A decaying log in the woods is a whole community in itself. Its rotting tissues supply food for many fungi and small insects which in turn serve as the food supply of still larger organisms.

Holes in the wood are the result of various wood-boring beetles, but if you watch you may see spiders going in and out of them. Hidden within the dead wood are colonies of termites whose sole diet is wood. Their bodies are not protected against evaporation and they do not venture out into the open.

In time the various decay organisms and chewing insects will break down the wood completely so that its rotting particles become a part of the soil.

How many different kinds of organisms can you find near this decaying log?

44. WILD GINGER, Asarum caudatum, from the Redwood Forest is a plant with hidden blossoms. The curious dark red flowers are very short-stemmed and are found on the ground beneath the leaves. They are pollinated by insects crawling around on the damp soil. The crushed leaves have distinct ginger fragrance.

45. As you cross the bridge, look up and down the creek to note the distribution of trees in relation to the stream bed. Right along the edge of the stream are WHITE ALDERS and also shrubby WILLOWS of this region. A little back from the stream, but still in the shelter of the canyon and close to underground water, are the tall trunks of WESTERN SYCAMORE. Still farther back from the stream and extending up the canyon slopes where the soil is drier, the COAST LIVE OAKS predominate. Out of the canyon on the mountain slopes where water is limited, soil is shallow, and there is full exposure to the sun, the trees give way to the plants of the chaparral.

The Lassiter Boulder at the edge of the stream north of the bridge is the largest rock in the Garden.

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THE SANTA BARBARA BOTANIC GARDEN
ASSOCIATION

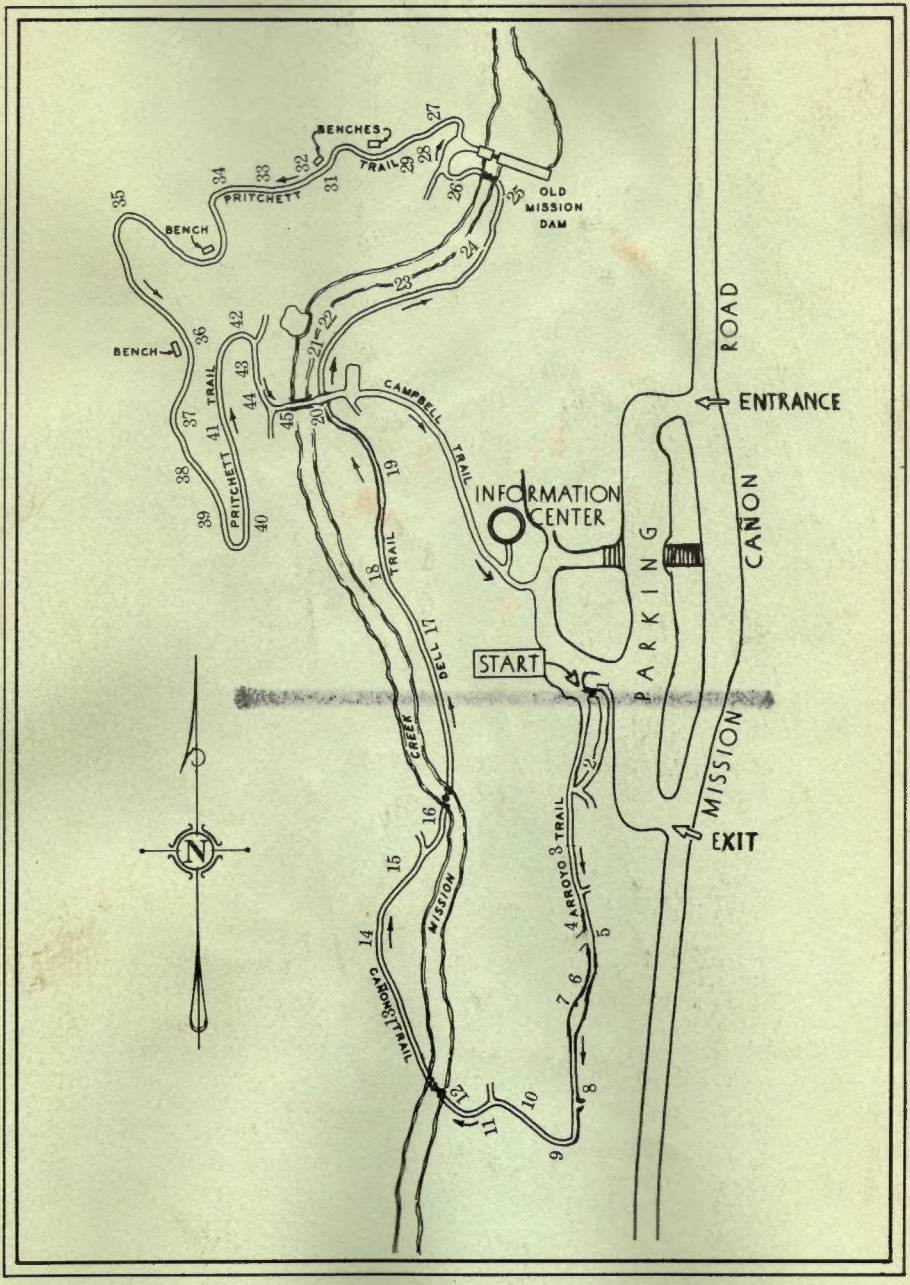
If you have enjoyed the Nature Trail, you may be interested in participating in other Botanic Garden activities. Members of the Santa Barbara Botanic Garden Association receive all publications of the Garden, are invited to lectures and special events, receive gift plants grown for this purpose in the Garden greenhouse, and have priority in Garden classes.

CLASSES OF MEMBERSHIP

[redacted]	$ 5.
Active Members	10.
Sustaining Members	25.
Contributing Members	50.
Associate Fellows	100.
Fellows	250.
Patrons	500.

Membership dues are deductible in computing Income Tax.

Further information and application blanks may be obtained at the office.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CAÑON
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